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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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MANABU OUMI

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09/09/2004

BRUCE L ADAMS
ADAMS & WILKS
50 BROADWAY
31ST FLOOR
NEW YORK, NY 10004

EXAMINER

LE, KIMLIEN T

ART UNIT

PAPER NUMBER

2653

DATE MAILED: 09/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/462,437

Applicant(s)

OUMI ET AL.

Examiner

Kimlien T Le

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6/24/2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 19, 20, 32-40, 42 and 44-58 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1, 19, 20, 32-40, 42 and 44 is/are allowed.
- 6) ☒ Claim(s) 45-47 and 50-56 is/are rejected.
- 7) ☒ Claim(s) 48, 49, 57 and 58 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 May 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed on November 5, 2003 have been fully considered but they are not deemed to be persuasive.

Applicant asserts on page 10:

"Tanaka would not have motivated one of ordinary skill in the art to modify the probe 30 of Schaenzer to provide a microscopic aperture protruding below the bottom surface of the slider without a coil."

The Examiner maintains that Ito et al. shows a microscopic aperture protruding below the bottom surface of the slider (Fig. 1B, element 1; See also column 4, lines 54-60) without a coil.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 45 and 50-53 are rejected under 35 U.S.C. 102(e) as being anticipated by Ito et al. (U.S. Patent 6, 304, 527).

Regarding claim 45, Ito et al. shows a near-field optical head, comprising: a slider (Fig. 11, element 1; See also column 10, lines 1-10) supported by a suspension arm (Fig.

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11, element 50; See also column 10, lines 1-10) providing a load weight and obtaining a floating force due to a relative motion of the slider with respect to a recording medium so that a gap is produced between a bottom surface of the slider (Fig. 1B, element 1; See also column 4, lines 54-60) and a surface of the recording medium (Fig. 1B, element 11; See also column 4, lines 54-60) due to a balance between the load weight and the floating force; and a probe (Fig. 1B, element 4; See also column 4, lines 60-65) comprising a through-hole formed in the slider and terminating in a microscopic aperture at the bottom surface of the slider for producing a near-field light or converting a near-field light produced on a surface of the recording medium into a propagation light without a lens being disposed proximate the microscopic aperture for producing or converting the near-field light; wherein the recording medium and the probe interact through the near-field light when the slider is caused to undergo scanning movement relative to a surface of the recording medium to thereby effect the recording of information onto the recording medium and the reproducing of information stored on the recording medium; and wherein the microscopic aperture is provided in a protruding portion of the bottom surface of the slider that protrudes toward the recording medium so that a distance between the microscopic aperture and the recording medium is smaller than a distance between a non-protruding portion of the bottom surface of the slider closest to the recording medium and the recording medium so that the probe can be brought to within several nanometers to several tens of nanometers close to the recording medium to enable high resolution optical reading and/or recording of data on the recording medium by the use of near-field light alone and without the use of a coil to locally heat the recording medium(column 5, lines 10-20).

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Regarding claim 50, Ito et al. shows a near-field optical head comprising: a support member (Fig. 11, element 1; See also column 10, lines 1-10) mounted to undergo relative movement with respect to a recording medium (Fig. 11, element 43; See also column 10, lines 1-10); and a probe (Fig. 1B, element 4; See also column 4, lines 60-65) protruding from a bottom surface of the support member and having a microscopic aperture formed therein for producing a near-field light or converting a near-field light produced at a surface of the recording medium into a propagation light without a lens being disposed proximate the microscopic aperture for producing or converting the near-field light; wherein the recording medium and the probe interact through the near-field light when the support member undergoes relative movement with respect to the surface of the recording medium; and wherein a part of the bottom surface of the support member closest to the recording medium is more distant from the recording medium than the microscopic aperture so that the microscopic aperture can be brought to within several nanometers to several tens of nanometers close to the sample to enable optical reading and/or recording of data on the recording medium by the use of near-field light alone and without the use of a coil to locally heat the recording medium(column 5, lines 10-20).

Regarding claim 51, Ito et al. shows a near-field optical head according to claim 50, wherein the support member comprises a slider (Fig. 11, element 1; See also column 10, lines 1-10) supported by a suspension arm Fig. 11, element 50; See also column 10, lines 1-10) for providing a load weight and producing a floating force in response to relative motion thereof with respect to the recording medium so that a gap is formed between the microscopic aperture and the recording medium due to a balance between the load weight and the floating force.

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Regarding claim 52, Ito et al. shows a near-field optical head according to claim 50; wherein the probe (Fig. 7B, element 4; See also column 8, lines 1-10) comprises a tapered projection mounted to the support member and having a sharpened tip protruding from the bottom surface of the support member.

Regarding claim 53, Ito et al. shows a near-field optical head according to claim 50; further comprising a through-hole formed in the support member (Fig. 10, element 1; See also column 8, lines 1-10) and terminating in the microscopic aperture.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 46-47 and 54-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al (U.S. Patent 6,304,527) in view of Tanaka (U.S. Patent 5,808,973).

Regarding claims 46 and 54, Ito et al shows all the features of claim 46 except for a light shielding layer covering the through-hole except for the microscopic aperture. However, Tanaka teaches the light shielding layer (Fig. 2, element 32; See also column 6, lines 1-10) covering the through-hole except for the microscopic aperture. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide Ito et al with the light shielding layer covering the through-hole except for the microscopic aperture as taught by Tanaka. The rationale is as follows: one of ordinary

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skill in the art at the time of the invention would have been motivated to provide Ito et al with the light shielding layer covering the through-hole except for the microscopic aperture as taught by Tanaka, in order to shield a part of the light.

Regarding claims 47, 55 and 56, Ito et al shows all the features of claims 46, 50 and 53, except for a light shielding layer covering the through-hole except for the microscopic aperture and a light source disposed on a top surface of the support member above the through-hole. However, Tanaka teaches a light shielding layer (Fig. 2, element 32; See also column 6, lines 1-10) covering the through-hole and a light source (Fig. 2, element 36; See also column 6, lines 14-20) disposed on a top surface of the support member above the through-hole. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide Ito et al with a light shielding layer covering the through-hole except for the microscopic aperture and a light source disposed on a top surface of the support member above the through-hole as taught by Tanaka. The rationale is as follows: one of ordinary skill in the art at the time of the invention would have been motivated to provide Ito et al with a light shielding layer covering the through-hole except for the microscopic aperture and a light source disposed on a top surface of the support member above the through-hole as taught by Tanaka, so that a light path is defined by the light source, the through-hole, and the microscopic aperture.

Allowable Subject Matter

4. Claims 1, 19-20, 32-40, 42 and 44 are allowed.

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5. Claims 48, 49, 57 and 58 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is an examiner's statement of reasons for allowance:

In claim 48, the limitation of a near-field optical head comprising a through-hole is formed in a reduced thickness portion of the slider; and further comprising a light source mounted on the reduced thickness portion of the slider above the through-hole, so that a light path is defined by the light source, the through-hole, and the microscopic aperture, taken in conjunction with the limitations of claim 45, is not anticipated by, nor made obvious over, the prior art of record.

In claim 57, the limitation of a near-field optical head comprising a through-hole formed in a reduced thickness portion of the support member and terminating in the microscopic aperture; and a light source disposed on a top surface of the reduced thickness portion of the support member above the through hole, so that a light path is defined by the light source, the through-hole, and the microscopic aperture, taken in conjunction with the limitations of claim 50, is not anticipated by, nor made obvious over, the prior art of record.

In claim 41, the limitation of a near-field optical head comprising a through-hole formed in a reduced thickness portion of the slider and terminating in the microscopic aperture; and a light source mounted on a top surface of the reduced thickness portion of the slider above the through hole, so that a light path is defined by the light source, the through-hole, and the microscopic aperture, taken in conjunction with the limitations of claim 1, is not anticipated by, nor made obvious over, the prior art of record.

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In claim 43, the limitation of a near-field optical head comprising a through-hole formed in a reduced thickness portion of the slider and terminating in the microscopic aperture; and a light source mounted on a top surface of the reduced thickness portion of the slider above the through hole, so that a light path is defined by the light source, the through-hole, and the microscopic aperture, taken in conjunction with the limitations of claim 19, is not anticipated by, nor made obvious over, the prior art of record.

Point of Contact


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimlien T Le whose telephone number is 703 305 3498. The examiner can normally be reached on M-F 8a.m-5p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Korzuch William can be reached on 703 305 6137. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Kimlien Le


WILLIAM KORZUCH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600